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SUBJECT: SEQUENCING IN THE [redacted] SYSTEM

1. [redacted] HAS STUDIED THE REQUIREMENTS FOR DIFFERENT SEQUENCES IN THE [redacted] SYSTEM.

2. THE PROBLEMS STUDIED INCLUDED:

A. TIME SEQUENCES
B. ANGULAR SEQUENCES
C. HORIZONTAL MENSURATION SEQUENCE REQUIREMENTS
D. VERTICAL MENSURATION SEQUENCING REQUIREMENT
E. MINIMUM AND MAXIMUM CONVERGENT ANGLES
F. MINIMUM AND MAXIMUM PHOTOGRAPHIC SEQUENCES
G. MINIMUM AND MAXIMUM OBLIQUITY ANGLES
H. MINIMUM AND MAXIMUM SCALE CHANGES

A. TIME SEQUENCES WERE STUDIED IN TERMS OF MEETING CONVERGENCE REQUIREMENTS. A TIME LIMITATION FOR SPACING OF PHOTOGRAPHY WITHIN THE SEQUENCE IS JUST AS APPLICABLE TO THE INTERPRETATION AND PHOTOGRAMMETRIC REDUCTION REQUIREMENTS AS THE ANGULAR SEQUENCES. IN EITHER CASE, THE MINIMUM COVERGENT ANGLE IS THE CONTROLLING FACTORS SEE (E) BELOW.

B. FIXED ANGULAR SEQUENCES ARE A HOLDOVER FROM PREVIOUS SYSTEMS, BUT HAVE NO VALUE OVER THE TIME BASED SEQUENCES WHEN THE MINIMUM CONVERGENT ANGLES ARE USED IN COMPUTING THE TIME BASED SEQUENCES FOR ACQUIRING THE STEREO PHOTOGRAPHY.

C. HORIZONTAL MENSURATION REQUIREMENTS ARE BASED ON THE MI[redacted] CONVERGENT ANGLE AT WHICH STEREO MENSURATION RPODUCES ERRORS NEAR THE MAGNITUDE OF THE RESOLUTION OF THE SYSTEM. THIS OCCURS AT ABOUT 15 DEGREES. [redacted] WOULD DESIRE THAT ALL SEQUENCES BE DISIGNED TO MEET THIS MINIMUM COVERGENG ANGLE OF 15 DEGREES. [redacted] HAS NO REQUIREMENT FOR MONOSCOPIC PHOTOGRAPHY. ACCURACIES OF MENSURATION INCREASES SLIGHTLY FROM 15 DEGREES TO 24 DEGREES CONVERGENT ANGLES ABOUT 24 DEGREES CONVERGENT ANGLE, THE ACCURACY IS BASICALLY THE SAME. WHEN TIME AND CAPABILITIES ALLOW LARGER CONVERGENCE ANGLES, I.E., LARGER THAN 24 DEGREES, THEY ARE PREFERRED SLIGHTLY OVER THE LOWER CONVERGENT ANGLES.

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D. VERTICAL INTERPRETATION AND VIEWING IS EASIER WITH HIGHER OBLIQUITY ANGLES THAN IN THE NEAR VERTICAL. WHEN VERTICAL INTERPRETATION IS REQUIRED OR IS OF OVERRIDING IMPORTANCE ON A TARGET, THE REQUIREMENTS MAY BE MORE POINTED TOWARDS A HIGH OBLIQUITY RATHER THAN CONVERGENCE ANGLE. IT IS EXPECTED THAT TARGETS REQUIRING ACCURATE VERTICAL DIMENSIONS WILL BE REQUESTED TO HAVE THE MAXIMUM OBLIQUITY ANGLES SUCH AS 20 DEGREES AFT FOR THE FINAL PHOTO IN THE SEQUENCE.

E. MINIMUM AND MAXIMUM CONVERGENT ANGLES. [redacted] DESIRES ALL TARGETS TAKEN AT A MINIMUM OF 15 DEGREES CONVERGENCE ANGLES WITH THE MAXIMUM DETERMINED BY THE CAMERA LIMITATIONS. ANY LARGER CONVERGENCE ANGLE (OVER 15 DEGREES) IS ACCEPTABLE.

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F. MINIMUM AND MAXIMUM PHOTOGRAPHIC SEQUENCES. THE DESIRED MINIMUM NUMBER OF PHOTOGRAPHS IN ANY SEQUENCE WOULD BE 2 PHOTOGRAPHS THAT MEETS THE CONVERGENCE REQUIREMENTS. THREE TO FIVE PHOTOGRAPHS OF THE MAJORITY OF THE TARGETS WOULD BE SATISFACTORY. THERE ARE A FEW TARGETS (100 TO 200) PER MISSION THAT WOULD REQUIRE THE MAXIMUM NUMBER OF PHOTOGRAPHS AVAILABLE. THESE ARE SPECIFIC TARGETS OF HIGH PRIORITY AND ARE GENERALLY EASILY IDENTIFIED TARGETS. THE ADDITION OF A COLOR [redacted] OR SPECIAL EMULSION PHOTOGRAPH AT THE BEGINNING OR END OF THE NORMAL 3 TO 5 PHOTOGRAPHS WOULD ENHANCE THE VALUE FOR SOME SPECIFIC TAGETS.

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GROUP 1 Excluded from automatic downgrading and declassification

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G. MINIMUM AND MAXIMUM OBLIQUITY ANGLES. CERTAIN TARGETS REQUIRE A LOOK ANGLE FROM THE SIDE, OR AN END VIEW; IN THESE CASES, THE MAXIMUM OBLIQUITY ANGLE AVAILABLE WOULD BE REQUIRED FOR A LEAST ONE PHOTOGRPH IN THAT SEQUENCE. IN THIS CASE, THE AFT LIMITS OF THE SYSTEM PROVIDES THE HIGHEST OBLIQUITY AVAILABLE; THEREFORE, THE SEQUENCE SHOULD BE BIASED TOWARDS THE AFT POSITIONS.

H. SCALE CHANGE BETWEEN A SELECT PAIR IN THE SEQUENCE SHOULD BE HELD TO A MINIMUM TO ENHANCE THE STEREO VIEWING CAPABILITY OF THE PHOTOGRAPHS. THIS MEANS THAT AT LEAST ONE PAIR OF THE PHOTOGRAPHS IN ANY SEQUENCE SHOULD MAINTAIN THE MINIMUM CONVERGENT CONDITION WHILE BEING CENTERED AROUND THE TIME OF CLOSEST APPROACH POSITION. THIS IS NOT A STRINGENT REQUIREMENT SINCE A PLUS OR MINUS 2 DEGREE CHANGE IN THE PITCH ANGLES DOES NOT APPRECIABLY CHANGE THE VALUE OF THE PHOTOGRAPHY. ANAMORPHIC LENSES ARE AVAILABLE TO ALLEVIATE

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THIS REQUIREMENT, BUT ARE NOT GENERALLY USED IN NORMAL ROUTINE VIEWING.

3. THE ABOVE DISCUSSIONS POINT OUT SOME LIMITATIONS ON SEQUENCES AND THEIR CHOICE. IN SUMMARY:

3A. A MINIMUM FORWARD LOOK ANGLE OF 7 1/2 TO 10 DEGREES FOR THE START OF ANY SEQUENCE, ANY LARGER FORWARD ANGLE WOULD BE SATISFACTORY.

3B. A MINIMUM OF 15 DEGREES CONVERGENCE ANGLE BETWEEN FIRST AND LAST PHOTOS OF ANY SEQUENCES, WITH ANY LARGER ANGLE BEING SATISFACTORY.

3C. VERTICAL VIEWING REQUIREMENTS WILL REQUIRE HIGH OBLIQUITY ANGLES. THIS MEANS THAT THE CONDITIONS (3A AND 3B) BE MET AND A FAR AFT PHOTO BE TAKEN IN ADDITION TO THE SEQUENCE FOR TARGETS REQUIRING VERTICAL VIEWING DIMENSIONS.

3D. SOME TARGETS WILL REQUIRE MAXIMUM NUMBERS OF PHOTOGRAPHS AND UNIQUE SEQUENCES, INCLUDING SPECIAL ENULSIONS.

3E. SCALE CHANGES BETWEEN STEREO PAIRS SHOULD BE HELD TO MEET THE VIEWING REQUIREMENTS BY CENTERING AT LEAST 2 OF THE PHOTOS IN ANY SEQUENCES AROUND THE TIME OF CLOSEST APPROACH POSITION.

3F. ALTHOUGH ANGULAR CONDITIONS HAVE BEEN USED IN THE EXPLANATIONS ABOVE, A TIME BASED SEQUENCE THAT MEETS THE MINIMUM REQURIEMENTS IS JUST AS APPOICABLE AS ANGULAR CONSIDERATIONS.

3G. GENERALLY, THE REQUIREMENT FOR A SPECIAL PHOTOGRAPH, SUCH AS COLOR, [redacted] SPECIAL EMULSION, HIGH OBLIQUITY, SPECIFIC LOOK ANGLE OR VIEW, OR ANY OTHER, WILL BE IN ADDITION TO A SEQUENCE THAT MEETS THE MINIMUM CONVERGENCE ANGLE, SCALE CONDITIONS, AND STEREO REQUIREMENTS. 25X1

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--END OF MESSAGE--

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